

### AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

#### Listing of Claims

1. (Currently Amended) A predistortion control device comprising: ~~(1);~~ including:
  - a first predistortion control input selectively connected ~~(10)~~ connectable to a power amplifier output ~~(24)~~;
  - a second predistortion control input selectively connected ~~(11)~~ connectable to a signal contact ~~(30,31)~~ of a predistortion device ~~(3)~~; and
  - a predistortion control output selectively connected ~~(12)~~ connectable to a control contact of the predistortion device, the predistortion control device ~~(1)~~ further including:
    - a cross-correlator device ~~(110)~~ connected with
      - a first cross-correlator input ~~(1101,1101I,1101Q)~~ to the first predistortion control input ~~(10)~~ and
      - a second cross-correlator input ~~(1102,1102I,1102Q)~~ to the second predistortion control input ~~(11)~~, which wherein the cross-correlator device ~~(110)~~ further has a cross-correlator output ~~(1112)~~ ~~(1112)~~ at which a cross-correlation signal can be presented, the cross-correlation signal representing a measured cross-correlation ( $R_m$ ) of signals presented at the first cross-correlator input ~~(1101, 1101I, 1101Q)~~ and the second cross-correlator input ~~(1102,1102I,1102Q)~~ ;
    - a predistortion function selector device ~~(120)~~, connected with
      - a selector input ~~(1210)~~ to the cross-correlator output ~~(1112)~~, and with
      - a selector output ~~(1211)~~ to the predistortion control output ~~(12)~~, said predistortion function selector device being arranged to compare the measured cross-correlation with a cross-correlation model stored in a memory ~~(122)~~ and determining on the basis of said comparison a suitable predistortion function and presenting a predistortion control signal at said

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selector output said predistortion control signal representing said ~~a~~ predistortion function.

2. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 1, further including a quantiser device ~~(404)~~ connected with a quantiser input to the first predistortion control input, and with a quantiser output to the first cross-correlator input ~~(1101, 1101I, 1101Q)~~.

3. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 2, wherein the quantiser device ~~(404)~~ is a single-bit quantiser.

4. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 2 ~~or 3~~, wherein the quantiser ~~(404)~~ is operable as a sub-sampling device.

5. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 2 ~~any one of claims 2-4~~, wherein the cross-correlator device ~~(110)~~ includes a single-bit multiplier ~~(111)~~.

6. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 2 ~~any one of claims 2-5~~, further including a distortion device ~~(402)~~ connected with a distortion input to the first predistortion control input, and connected with a distortion output to the quantiser input.

7. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 6, wherein the distortion device includes a random distortion device.

8. (Currently Amended) The [[A]] predistortion control device ~~(4)~~ as claimed in claim 6 ~~or 7~~, wherein the distortion device includes a periodic distortion device.

9. (Currently Amended) The ~~[[A]]~~ predistortion control device (4) as claimed in claim 1 ~~any one of the preceding claims~~, wherein the second predistortion control input (44) is connectable to a signal output of a predistortion device.

10. (Currently Amended) The ~~[[A]]~~ predistortion control device (4) as claimed in claim 1 ~~any one of the preceding claims~~, further including:

an averaging device (412) capable of determining a time averaged cross-correlation value from a memory connected to the cross-correlator output (4112), for storing a number of cross-correlation values, ~~which~~ wherein the averaging device has an averaging output connected to the selector input, for presenting time averaged cross-correlation values to the predistortion function selector device (420).

11. (Currently Amended) ~~An assembly of a~~ The predistortion control device, as claimed in claim 1 ~~(1) as claimed in any one of claims 1-10, and a predistortion device (3) having signal contacts (30,31) further comprising: including~~  
a predistortion input (30) for receiving an original signal to be predistorted; ~~and~~  
a predistortion output (34) for providing a predistorted output signal based on the original signal, and  
a control input contact (32) connected to the predistortion control output (42) at which a predistortion control signal can be provided, in response to which predistortion control signal the predistortion device uses a predistortion function corresponding to the predistortion control signal to generate the predistorted output signal.

12. (Currently Amended) ~~An assembly~~ The predistortion control device as claimed in claim 11, further including a power amplifier (2) connected with:  
an amplifier input (20) to the predistortion output (34), and  
~~with an amplifier output (21) to the first predistortion control input (400).~~

13. (Canceled)

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<sup>13</sup>~~14~~. (Currently Amended) A predistortion control method, comprising the steps of: including:

- receiving a power amplifier output signal;
- receiving a predistortion signal from a signal contact of a predistortion device;
- determining a measured cross-correlation value by cross-correlating the power amplifier output signal and the predistortion signal;
- comparing the measured cross-correlation value with a [[an]] cross-correlation model;
- determining a suitable predistortion function from said comparing step ~~a suitable predistortion function~~, and
- providing a predistortion control signal representing said predistortion function.

<sup>14</sup>~~15~~. (Previously Presented) The [[A]] predistortion control method, as claimed in claim <sup>13</sup>~~14~~, further comprising:

- minimising a difference between the measured cross-correlation value with a ~~an~~ model cross-correlation value, and
- deriving from said minimizing step the predistortion function.

<sup>15</sup>~~16~~. (New) An arrangement for controlling predistortion in a power amplifier, the arrangement comprising:

- a predistortion control device;
- a first predistortion control input selectively connected to a power amplifier output;
- a second predistortion control input selectively connected to a signal contact of a predistortion device; and
- a predistortion control output selectively connected to a control contact of the predistortion device, the predistortion control device further including:
  - a cross-correlator device connected with
    - a first cross-correlator input to the first predistortion control input
    - and

a second cross-correlator input to the second predistortion control input, wherein the cross-correlator device further has a cross-correlator output at which a cross-correlation signal can be presented, the cross-correlation signal representing a measured cross-correlation ( $R_m$ ) of signals presented at the first cross-correlator input and the second cross-correlator input;

a predistortion function selector device, connected with  
a selector input to the cross-correlator output, and with  
a selector output to the predistortion control output, said pre-distortion function selector device being arranged to compare the measured cross-correlation with a cross-correlation model stored in a memory and determining on the basis of said comparison a suitable predistortion function and presenting a predistortion control signal at said selector output said predistortion control signal representing said ~~a~~ predistortion function.

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<sup>16</sup>~~17~~. (New) The arrangement as claimed in claim <sup>15</sup>~~16~~, further including a quantiser device connected with a quantiser input to the first predistortion control input, and with a quantiser output to the first cross-correlator input.

<sup>17</sup>~~18~~. (New) The arrangement as claimed in claim <sup>15</sup>~~16~~, wherein the quantiser device is a single-bit quantiser.

<sup>18</sup>~~19~~. (New) The arrangement as claimed in claim <sup>16</sup>~~17~~, wherein the quantiser is operable as a sub-sampling device.

<sup>19</sup>~~20~~. (New) The arrangement as claimed in claim <sup>16</sup>~~17~~, wherein the cross-correlator device includes a single-bit multiplier.

<sup>20</sup>~~21~~ (New) The arrangement as claimed in claim <sup>16</sup>~~17~~, further including a distortion device connected with a distortion input to the first predistortion control input, and connected with a distortion output to the quantiser input.

<sup>21</sup>~~22~~ (New) The arrangement as claimed in claim <sup>20</sup>~~21~~, wherein the distortion device includes a random distortion device.

<sup>22</sup>~~23~~ (New) The arrangement as claimed in claim <sup>20</sup>~~21~~, wherein the distortion device includes a periodic distortion device.

PN <sup>23</sup>~~24~~ (New) The arrangement as claimed in claim <sup>15</sup>~~16~~, wherein the second predistortion control input is connectable to a signal output of a predistortion device.

<sup>24</sup>~~25~~ (New) The arrangement as claimed in claim <sup>15</sup>~~16~~, further including:  
an averaging device capable of determining a time averaged cross-correlation value from a memory connected to the cross-correlator output, for storing a number of cross-correlation values, wherein the averaging device has an averaging output connected to the selector input, for presenting time averaged cross-correlation values to the predistortion function selector device.

<sup>25</sup>~~26~~ (New) The arrangement as claimed in claim <sup>15</sup>~~16~~, further comprising:  
a predistortion input for receiving an original signal to be predistorted;  
a predistortion output for providing a predistorted output signal based on the original signal, and  
a control input contact connected to the predistortion control output at which a predistortion control signal can be provided, in response to which predistortion control signal the predistortion device uses a predistortion function corresponding to the predistortion control signal to generate the predistorted output signal.

<sup>26</sup>27. (New) The arrangement as claimed in claim <sup>25</sup>~~26~~, wherein the power  
amplifier is connected with:

an amplifier input to the predistortion output, and  
an amplifier output to the first predistortion control input.